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EXAMINER

BELL, MELTIN

ART UNIT PAPER NUMBER

2129

DATE MAILED: 03/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/037,040

Applicant(s)

MCDANIEL ET AL.

Examiner

Mellin Bell

Art Unit

2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2001 and 29 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 April 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8/29/03; 4/16/02</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This action is responsive to application **10/037,040** filed **12/21/2001**.

Claims 1-25 have been examined.

Drawings

The drawings have not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is required in correcting any errors of which applicant may become aware in the drawings.

The drawings are objected to because:

- Fig. 4, item 74 would read well labeled PROCESSING ENGINE as suggested on page 8, line 27

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is required in correcting any errors of which applicant may become aware in the specification.

The disclosure is objected to because of the following informalities:

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- The discussion of Fig. 1 in the Background of the Invention section page 3, line 17 through page 5, line 13 would read well placed in the Detailed Description of the Invention section beginning on page 7
- '60' on page 10, line 9-11 would read well as '80'
- '64' on page 10, line 11 would read well as '84'

Appropriate correction is required.

Claim Objections

Claim 7 and 23 are objected to because of the following informalities:

Regarding claim 7:

- 'wherein a' on page 13, line 6 would read well as 'wherein the decision tree structure comprises a'
- 'of the plurality' on page 13, line 7 would read well as 'of a plurality'

Regarding claim 23:

- 'method' on page 15, line 19 would read well as 'apparatus'

Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-3, 5-19 and 21-23 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The language of the claims (e.g. "search object", "entry", "knowledge base") raise a question as to whether the claims are directed merely to an abstract idea that is not tied to a technological art, environment or machine which would result in a practical application producing a concrete, useful, and tangible result to form the basis of statutory subject matter under 35 U.S.C. 101. For example, if the independent claims were amended to recite a computer-implemented method or apparatus and required performance of a result outside of a computer, it will be statutory in most cases since use of technology permits the function of the descriptive material to be realized.

Claim Rejections - 35 USC § 103

To expedite a complete examination of the instant application, the claims rejected under 35 U.S.C. 101 (nonstatutory) above are further rejected as set forth below in anticipation of applicant amending these claims to place them within the four statutory categories of invention.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the Office presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Office to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 6, 13, 15, 18-19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Bennett* United States Patent Number (USPN) 5,813,001 "Method for performing optimized intelligent searches of knowledge bases using submaps associated with search objects" (Sep. 22, 1998) in view of *Bialkowski et al* USPN 5,463,777 "System for segmenting data packets to form binary decision trees which determine filter masks combined to filter the packets for forwarding" (Oct. 31, 1995).

Regarding claim 1:

Bennett teaches,

- A method for determining whether a search object matches an entry in a knowledge base (Abstract), wherein the knowledge base comprises a plurality of search nodes, and a plurality of links joining two search nodes (Fig. 2; column 6, lines 45-63), said method comprising
- reading (column 4, lines 66-67; column 5, lines 1-22) a first search node from the first memory

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- comparing the first search node with at least a portion of the search object (column 5, lines 23-45)

- based on the comparing step, traversing a search path (column 8, lines 59-61) from the first search node to a second search node via the joining link

However, *Bennett* doesn't explicitly teach the knowledge base comprises a decision tree structure while *Bialkowski et al* teaches,

- A method (Abstract; column 1, lines 62-67), wherein the knowledge base comprises a decision tree structure comprising a plurality of search nodes, and a plurality of links joining two search nodes (column 3, lines 40-52), said method comprising

- storing a first portion of the decision tree structure in a first memory (Fig. 1; column 2, lines 9-22), wherein the first portion comprises a first plurality of search nodes and interconnecting links

- storing a second portion of the decision tree structure in a second memory (Fig. 1; column 6, lines 22-41), wherein the second portion comprises a second plurality of search nodes and interconnecting links

Motivation - The portions of the claimed method would have been a highly desirable feature in this art for maintaining memory requirements and other hardware needs at a minimum (*Bialkowski et al*, column 1, lines 32-39). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Bennett* as taught by *Bialkowski et al* for the purpose of maintaining memory requirements.

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Regarding claim 2:

The rejection of claim 2 is similar to that for claim 1 as recited above since the stated limitations of the claim are set forth in the references. Claim 2's limitations difference is taught in *Bennett*:

- reading the second search node and comparing at least a portion of the search object with the second search node (column 5, lines 7-45)

Regarding claim 3:

The rejection of claim 3 is similar to that for claim 1 as recited above since the stated limitations of the claim are set forth in the references. Claim 3's limitations difference is taught in *Bennett*:

- the steps of reading, comparing and traversing are repeated until the second portion of the decision tree is traversed to an end thereof (column 16, lines 35-53)

Regarding claim 6:

The rejection of claim 6 is the same as that for claim 1 as recited above since the stated limitations of the claim are set forth in the references.

Regarding claim 13:

The rejection of claim 13 is the same as that for claims 1 and 3 as recited above since the stated limitations of the claim are set forth in the references.

Regarding claim 15:

The rejection of claim 15 is similar to that for claim 1 as recited above since the stated limitations of the claim are set forth in the references. Claim 15's limitations difference is taught in *Bialkowski et al*:

- the decision tree structure comprises a plurality of contiguous (column 1, line 67; column 2, lines 1-8) tree levels, wherein each tree level further comprises a search node and link to a search node of the next adjacent tree level

Regarding claim 18:

Bennett teaches,

- An apparatus for determining whether a search object matches any entry in a knowledge base (Abstract), wherein the knowledge base comprises a plurality of links between adjacent search nodes (Fig. 2; column 6, lines 45-63)

However, *Bennett* doesn't explicitly teach the knowledge base comprises a decision tree structure while *Bialkowski et al* teaches,

- An apparatus (Abstract; column 1, lines 62-67) wherein the knowledge base comprises a decision tree structure comprising a plurality of links between adjacent search nodes (column 3, lines 40-52), said apparatus comprising
 - a first memory storing a first portion of the decision tree structure (Fig. 1; column 2, lines 9-22)
 - a second memory storing a second portion of the decision tree structure (Fig. 1; column 6, lines 22-41)
 - a processor (column 1, lines 22-28) for matching at least a portion of the search object with a search node and for traversing through the decision tree structure in response to the match

Motivation - The portions of the claimed apparatus would have been a highly desirable feature in this art for maintaining memory requirements and other hardware needs at a

minimum (*Bialkowski et al*, column 1, lines 32-39). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Bennett* as taught by *Bialkowski et al* for the purpose of maintaining memory requirements.

Regarding claim 19:

The rejection of claim 19 is the same as that for claims 18 and 1 as recited above since the stated limitations of the claim are set forth in the references.

Regarding claim 22:

The rejection of claim 22 is the same as that for claims 18 and 1 as recited above since the stated limitations of the claim are set forth in the references.

Claims 4 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Bennett* in view of *Bialkowski et al* and in further view of *Pollack et al* USPN 6,571,238 "System for regulating flow of information to user by using time dependent function to adjust relevancy threshold" (Filed Jun. 11, 1999).

Regarding claim 4:

Bennett teaches,

- A method for determining whether a search object matches) an entry in a knowledge base (Abstract), wherein the knowledge base comprises a plurality of search nodes, and a plurality of links joining two search nodes (Fig. 2; column 6, lines 45-63), said method comprising

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- reading (column 4, lines 66-67; column 5, lines 1-22) a first search node from the first memory
- comparing the first search node with at least a portion of the search object (column 5, lines 23-45)
- based on the comparing step, traversing a search path (column 8, lines 59-61) from the first search node to a second search node via the joining link

However, *Bennett* doesn't explicitly teach the knowledge base comprises a decision tree structure or the step of reading is executed by a processor formed in an integrated circuit, and wherein the first memory is formed on the integrated circuit, such that the step of reading search nodes from the first memory executes faster than the step of reading search nodes from the second memory while *Bialkowski et al* teaches,

- A method (Abstract; column 1, lines 62-67), wherein the knowledge base comprises a decision tree structure comprising a plurality of search nodes, and a plurality of links joining two search nodes (column 3, lines 40-52), said method comprising
 - storing a first portion of the decision tree structure in a first memory (Fig. 1; column 2, lines 9-22), wherein the first portion comprises a first plurality of search nodes and interconnecting links
 - storing a second portion of the decision tree structure in a second memory (Fig. 1; column 6, lines 22-41), wherein the second portion comprises a second plurality of search nodes and interconnecting links

Pollack et al teaches,

- the step of reading is executed by a processor formed in an integrated circuit, and

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wherein the first memory is formed on the integrated circuit, such that the step of reading search nodes from the first memory executes faster than the step of reading search nodes from the second memory (column 10, lines 54-67; column 11, lines 1-3)

Motivation - The portions of the claimed method would have been a highly desirable feature in this art for maintaining memory requirements and other hardware needs at a minimum (*Bialkowski et al*, column 1, lines 32-39) and managing data movement (*Pollack et al*, column 11, lines 6-10). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Bennett* as taught by *Bialkowski et al* and *Pollack et al* for the purpose of maintaining memory requirements and managing data movement.

Regarding claim 20:

The rejection of claim 20 is the same as that for claims 18 and 4 as recited above since the stated limitations of the claim are set forth in the references.

Claims 5 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Bennett* in view of *Bialkowski et al* and in further view of *Nakano et al* USPN 6,636,802 "Data structure of digital map file" (PCT Filed Nov. 24, 1999).

Regarding claim 5:

Bennett teaches,

- A method for determining whether a search object matches) an entry in a knowledge base (Abstract), wherein the knowledge base comprises a plurality of search nodes,

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and a plurality of links joining two search nodes (Fig. 2; column 6, lines 45-63), said method comprising

- reading (column 4, lines 66-67; column 5, lines 1-22) a first search node from the first memory
- comparing the first search node with at least a portion of the search object (column 5, lines 23-45)
- based on the comparing step, traversing a search path (column 8, lines 59-61) from the first search node to a second search node via the joining link

However, *Bennett* doesn't explicitly teach the knowledge base comprises a decision tree structure or the first portion of the decision tree structure comprises the search nodes near the first search entry while *Bialkowski et al* teaches,

- A method (Abstract; column 1, lines 62-67), wherein the knowledge base comprises a decision tree structure comprising a plurality of search nodes, and a plurality of links joining two search nodes (column 3, lines 40-52), said method comprising
 - storing a first portion of the decision tree structure in a first memory (Fig. 1; column 2, lines 9-22), wherein the first portion comprises a first plurality of search nodes and interconnecting links
 - storing a second portion of the decision tree structure in a second memory (Fig. 1; column 6, lines 22-41), wherein the second portion comprises a second plurality of search nodes and interconnecting links

Nakano et al teaches,

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- the first portion of the decision tree structure comprises the search nodes near the first search entry (column 41, lines 45-60)

Motivation - The portions of the claimed method would have been a highly desirable feature in this art for maintaining memory requirements and other hardware needs at a minimum (*Bialkowski et al*, column 1, lines 32-39) and speeding up the entry node search (*Nakano et al*, column 41, lines 60-62). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Bennett* as taught by *Bialkowski et al* and *Nakano et al* for the purpose of maintaining memory requirements and speeding up the entry node search.

Regarding claim 17:

The rejection of claim 17 is the same as that for claims 15 and 5 as recited herein since the stated limitations of the claim are set forth in the references.

Claims 7-9, 16 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Bennett* in view of *Bialkowski et al* and in further view of *Vahalia et al* USPN 6,625,591 "Very efficient in-memory representation of large file system directories" (Filed Sep. 29, 2000).

Regarding claim 7:

Bennett teaches,

- A method for determining whether a search object matches) an entry in a knowledge base (Abstract), wherein the knowledge base comprises a plurality of search nodes,

and a plurality of links joining two search nodes (Fig. 2; column 6, lines 45-63), said method comprising

- reading (column 4, lines 66-67; column 5, lines 1-22) a first search node from the first memory
- comparing the first search node with at least a portion of the search object (column 5, lines 23-45)
- based on the comparing step, traversing a search path (column 8, lines 59-61) from the first search node to a second search node via the joining link

However, *Bennett* doesn't explicitly teach the knowledge base comprises a decision tree structure or a predetermined number of lower levels of the plurality of levels are stored in the first memory, and wherein the remaining plurality of levels are stored in the second memory while *Bialkowski et al* teaches,

- A method (Abstract; column 1, lines 62-67), wherein the knowledge base comprises a decision tree structure comprising a plurality of search nodes, and a plurality of links joining two search nodes (column 3, lines 40-52), said method comprising
 - storing a first portion of the decision tree structure in a first memory (Fig. 1; column 2, lines 9-22), wherein the first portion comprises a first plurality of search nodes and interconnecting links
 - storing a second portion of the decision tree structure in a second memory (Fig. 1; column 6, lines 22-41), wherein the second portion comprises a second plurality of search nodes and interconnecting links

Vahalia et al teaches,

- a predetermined number of lower levels of the plurality of levels are stored in the first memory, and wherein the remaining plurality of levels are stored in the second memory (column 13, line 67; column 14, lines 1-23)

Motivation - The portions of the claimed method would have been a highly desirable feature in this art for maintaining memory requirements and other hardware needs at a minimum (*Bialkowski et al*, column 1, lines 32-39) and managing data movement (*Pollack et al*, column 11, lines 6-10) and accelerating a search (*Vahalia et al*, column 2, lines 47-49). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Bennett* as taught by *Bialkowski et al* and *Vahalia et al* for the purpose of maintaining memory requirements and accelerating a search.

Regarding claim 8:

The rejection of claim 8 is the same as that for claim 7 as recited above since the stated limitations of the claim are set forth in the references.

Regarding claim 9:

The rejection of claim 9 is the same as that for claims 1 and 7 as recited above since the stated limitations of the claim are set forth in the references.

Regarding claim 16:

The rejection of claim 16 is the same as that for claims 15 and 7 as recited above since the stated limitations of the claim are set forth in the references.

Regarding claim 21:

The rejection of claim 21 is the same as that for claims 18 and 7 as recited above since the stated limitations of the claim are set forth in the references.

Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Bennett* in view of *Bialkowski et al* and in further view of *Friedberg* USPN 6,662,184 "Very efficient in-memory representation of large file system directories" (Filed Sep. 22, 2000).

Regarding claim 10:

Bennett teaches,

- A method for determining whether a search object matches) an entry in a knowledge base (Abstract), wherein the knowledge base comprises a plurality of search nodes, and a plurality of links joining two search nodes (Fig. 2; column 6, lines 45-63), said method comprising
- reading (column 4, lines 66-67; column 5, lines 1-22) a first search node from the first memory
- comparing the first search node with at least a portion of the search object (column 5, lines 23-45)
- based on the comparing step, traversing a search path (column 8, lines 59-61) from the first search node to a second search node via the joining link

However, *Bennett* doesn't explicitly teach the knowledge base comprises a decision tree structure or the search object comprises a plurality of symbols while *Bialkowski et al* teaches,

- A method (Abstract; column 1, lines 62-67), wherein the knowledge base comprises a decision tree structure comprising a plurality of search nodes, and a plurality of links joining two search nodes (column 3, lines 40-52), said method comprising
- storing a first portion of the decision tree structure in a first memory (Fig. 1; column 2, lines 9-22), wherein the first portion comprises a first plurality of search nodes and interconnecting links
- storing a second portion of the decision tree structure in a second memory (Fig. 1; column 6, lines 22-41), wherein the second portion comprises a second plurality of search nodes and interconnecting links

Friedberg teaches,

- the search object comprises a plurality of symbols (column 10, lines 66-67; column 11, lines 1-10)

Motivation - The portions of the claimed method would have been a highly desirable feature in this art for maintaining memory requirements and other hardware needs at a minimum (*Bialkowski et al*, column 1, lines 32-39) and searching and retrieving data (*Friedberg*, Abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Bennett* as taught by *Bialkowski et al* and *Friedberg* for the purpose of maintaining memory requirements and searching/retrieving data.

Regarding claim 11:

The rejection of claim 11 is the same as that for claim 10 as recited above since the stated limitations of the claim are set forth in the references.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Bennett* in view of *Bialkowski et al* and in further view of *Corl et al* USPN 6,772,223

“Configurable classification interface for networking devices supporting multiple action packet handling rules” (Filed Apr. 10, 2000).

Regarding claim 12:

Bennett teaches,

- A method for determining whether a search object matches) an entry in a knowledge base (Abstract), wherein the knowledge base comprises a plurality of search nodes, and a plurality of links joining two search nodes (Fig. 2; column 6, lines 45-63), said method comprising
- reading (column 4, lines 66-67; column 5, lines 1-22) a first search node from the first memory
- comparing the first search node with at least a portion of the search object (column 5, lines 23-45)
- based on the comparing step, traversing a search path (column 8, lines 59-61) from the first search node to a second search node via the joining link

However, *Bennett* doesn't explicitly teach the knowledge base comprises a decision tree structure or the knowledge base comprises a classification engine of a

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communications network processor for determining an attribute of the data input thereto, and wherein the second portion of the decision tree ends in a plurality of terminating nodes, the method further comprising repeating the steps of reading, comparing and traversing until a terminating node is reached, wherein the terminating node identifies the attribute of the input data while *Bialkowski et al* teaches,

- A method (Abstract; column 1, lines 62-67), wherein the knowledge base comprises a decision tree structure comprising a plurality of search nodes, and a plurality of links joining two search nodes (column 3, lines 40-52), said method comprising

- storing a first portion of the decision tree structure in a first memory (Fig. 1; column 2, lines 9-22), wherein the first portion comprises a first plurality of search nodes and interconnecting links

- storing a second portion of the decision tree structure in a second memory (Fig. 1; column 6, lines 22-41), wherein the second portion comprises a second plurality of search nodes and interconnecting links

Corl et al teaches,

- the knowledge base comprises a classification engine of a communications network processor for determining an attribute of the data input thereto (column 2, lines 11-27), and wherein the second portion of the decision tree ends in a plurality of terminating nodes, the method further comprising repeating the steps of reading, comparing and traversing until a terminating node is reached, wherein the terminating node identifies the attribute of the input data (column 2, lines 58-67; column 3 lines 1-28)

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Motivation - The portions of the claimed method would have been a highly desirable feature in this art for maintaining memory requirements and other hardware needs at a minimum (*Bialkowski et al*, column 1, lines 32-39) and defining the types of actions that are to be applied to packets processed by a network processor device (*Corl et al*, Abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Bennett* as taught by *Bialkowski et al* and *Corl et al* for the purpose of maintaining memory requirements and defining network processor packet action types.

Claims 14 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Bennett* in view of *Bialkowski et al* and in further view of *Benayoun et al* USPN 6,516,319 B1 "Parallelized processing device for processing search keys based upon tree structure" (Filed May 11, 2000).

Regarding claim 14:

Bennett teaches,

- A method for determining whether a search object matches) an entry in a knowledge base (Abstract), wherein the knowledge base comprises a plurality of search nodes, and a plurality of links joining two search nodes (Fig. 2; column 6, lines 45-63), said method comprising

- reading (column 4, lines 66-67; column 5, lines 1-22) a first search node from the first memory

- comparing the first search node with at least a portion of the search object (column 5, lines 23-45)
- based on the comparing step, traversing a search path (column 8, lines 59-61) from the first search node to a second search node via the joining link

However, *Bennett* doesn't explicitly teach the knowledge base comprises a decision tree structure or each one of the plurality of search nodes comprises an instruction and an address field, wherein the step of comparing further comprises comparing at least a portion of the search object with the instruction, and wherein the address field determines the second search node based on the comparing step while *Bialkowski et al* teaches,

- A method (Abstract; column 1, lines 62-67), wherein the knowledge base comprises a decision tree structure comprising a plurality of search nodes, and a plurality of links joining two search nodes (column 3, lines 40-52), said method comprising
 - storing a first portion of the decision tree structure in a first memory (Fig. 1; column 2, lines 9-22), wherein the first portion comprises a first plurality of search nodes and interconnecting links
 - storing a second portion of the decision tree structure in a second memory (Fig. 1; column 6, lines 22-41), wherein the second portion comprises a second plurality of search nodes and interconnecting links

Benayoun et al teaches,

- each one of the plurality of search nodes comprises an instruction and an address field, wherein the step of comparing further comprises comparing at least a portion of

the search object with the instruction, and wherein the address field determines the second search node based on the comparing step (column 8, lines 15-21)

Motivation - The portions of the claimed method would have been a highly desirable feature in this art for maintaining memory requirements and other hardware needs at a minimum (*Bialkowski et al*, column 1, lines 32-39) and searching for the tree leaf matching a search key (*Benayoun et al*, Abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Bennett* as taught by *Bialkowski et al* and *Benayoun et al* for the purpose of maintaining memory requirements and matching a search key.

Regarding claim 23:

Bennett teaches,

- An apparatus for determining whether a search object matches any entry in a knowledge base (Abstract), wherein the knowledge base comprises a plurality of links connecting adjacent search nodes (Fig. 2; column 6, lines 45-63)

However, *Bennett* doesn't explicitly teach the knowledge base comprises a decision tree structure or first and second processors while *Bialkowski et al* teaches,

- An apparatus (Abstract; column 1, lines 62-67) wherein the knowledge base comprises a decision tree structure comprising a plurality of links connecting adjacent search nodes (column 3, lines 40-52), said **method** comprising

- a first memory storing a first portion of the decision tree structure (Fig. 1; column 2, lines 9-22)

- a second memory storing a second portion of the decision tree structure (Fig. 1; column 6, lines 22-41)

Benayoun et al teaches,

- a first processor (Fig. 1, item 30)

- a second processor (Fig. 1, item 32)

- wherein said first processor accesses said first memory, and wherein said second processor accesses said second memory for determining the search node that matches at least a portion of said search object (column 2, lines 20-46; column 9, lines 45-46)

Motivation - The portions of the claimed apparatus/method would have been a highly desirable feature in this art for maintaining memory requirements and other hardware needs at a minimum (*Bialkowski et al*, column 1, lines 32-39) and searching for the tree leaf matching a search key (*Benayoun et al*, Abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify *Bennett* as taught by *Bialkowski et al* and *Benayoun et al* for the purpose of maintaining memory requirements and matching a search key.

Regarding claim 24:

The rejection of claim 24 is the same as that for claims 23 and 1 as recited above since the stated limitations of the claim are set forth in the references.

Regarding claim 25:

The rejection of claim 25 is similar to that for claim 23 as recited above since the stated limitations of the claim are set forth in the references. Claim 25's limitations difference is taught in *Benayoun et al*:

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- the first processor and the second processor simultaneously execute tree searches for a plurality of search trees (column 8, lines 42-47)

Conclusion

The following prior art made of record is considered pertinent to applicant's disclosure:

- *van der Wal et al*; US 5963675 A; Pipelined pyramid processor for image processing systems
- *Nagral et al*; US 6260044 B1; Information storage and retrieval system for storing and retrieving the visual form of information from an application in a database
- *Srivastava et al*; US 6563952 B1; Method and apparatus for classification of high dimensional data
- *Tzeng*; US 6061712 A; Method for IP routing table look-up
- *Singh et al*; US 5983224 A; Method and apparatus for reducing the computational requirements of K-means data clustering
- *Lomet*; US 4611272 A; Key-accessed file organization
- *Wu et al*; US 6381607 B1; System of organizing catalog data for searching and retrieval
- *Israni et al*; US 5968109 A; System and method for use and storage of geographic data on physical media
- *Powers et al*; US 5404513 A; Method for building a database with multi-dimensional search tree nodes

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- *Simonetti*; US 5295261 A; Hybrid database structure linking navigational fields having a hierarchial database structure to informational fields having a relational database structure
- *Zellweger*; US 5630125 A; Method and apparatus for information management using an open hierarchical data structure
- *Marquis*; US 5930805 A; Storage and retrieval of ordered sets of keys in a compact 0-complete tree
- *Demuyneck et al*; Bmad-tree: an efficient data structure for parallel processing; Eighth IEEE Symposium on Parallel and Distributed Processing; 23-26 Oct. 1996; pp 384-391

Any inquiry concerning this communication or earlier communications from the Office should be directed to Melvin Bell whose telephone number is 571-272-3680. This Examiner can normally be reached on Mon - Fri 7:30 am - 4:00 pm.

If attempts to reach this Examiner by telephone are unsuccessful, his supervisor, Anthony Knight, can be reached on 571-272-3687. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2100.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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March 28, 2005


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